FULLBR_READER: User Manual

Introduction

Thank you for choosing the FULLBR_READER by Jones Technology Services. This manual provides detailed instructions on how to use, maintain, and customize your device. Please read this manual thoroughly before operating the device to ensure proper usage and optimal performance.

Table of Contents

1. Device Overview

The FULLBR_READER is a compact, user-friendly tool designed to provide a live readout for strain gauges and other 4-wire wheatstone bridge sensors. It features:

- A single button for all operations

- An OLED display for visual feedback

- Storage for up to 5 custom calibration formulas

- Compatibility with various probes

- Open-source design for customization

- Built-in PG7 female threaded port for easy sensor connection

2. Getting Started

2.1 Unboxing

Upon receiving your device, carefully unpack it and ensure all components are present:

- Outer Enclosure

- Inner Chassis

- 9V battery

- User manual

2.2 Battery Installation

1. Locate the battery slot in the inner chassis.

2. Connect the provided 9V battery, ensuring correct polarity.

3. Slide the chassis into the outer enclosure.

3. Operating Instructions

3.1 Turning On the Device

1. Press the single button on the device.

2. The OLED screen will illuminate, indicating the device is on.

3. The device will display "0.00mV/V" when ready for probe connection.

3.2 Connecting the Probe

IMPORTANT: Only connect the probe after the device is turned on and displays "0.00mV/V" (+/- 0.02).

1. Locate the probe connection port on the device.
2. Carefully insert the probe connector into the port.
3. Ensure a secure connection to avoid measurement errors.

3.3 Operating the Device

1. Once the probe is connected, the device will automatically begin its operation.
2. The device will run for 1 minute, displaying relevant information on the OLED screen.
3. The heart icon in the top right corner will blink once per second while the device is on.
4. The device will automatically turn off after 1 minute of operation.

3.4 Cycling Between Calibration Formulas

1. While the device is on, press the button to cycle between stored calibration formulas.
2. The current formula will be displayed on the OLED screen.
3. Continue pressing the button to cycle through all available formulas.

3.5 Turning Off the Device

Open the device and disconnect the 9V battery from its connector to turn off the device.

4. Maintenance

4.1 Battery Replacement

If the device fails to turn on when the button is pressed, replace the battery:

1. Open the battery compartment.
2. Remove the old 9V battery.
3. Insert a new 9V battery, ensuring correct polarity.
4. Close the battery compartment securely.

5. Customization

5.1 Modifying Stored Probes

To change your stored probes, you can modify the device's script using the Arduino IDE:

1. Download and install the Arduino IDE from arduino.cc.
2. Download the device script from [insert link to script here].
3. Open the script in the Arduino IDE.
4. Locate the section for stored probe calibrations.
5. Modify the calibration formulas as needed. Obtain accurate calibration coefficients from the manufacturer of your sensor.

6. Upload the modified script to your device following Arduino's standard upload procedure.

6. Troubleshooting

Problem	Possible Cause	Solution
Device doesn't turn on	Dead battery	Replace the 9V battery
Inaccurate readings	Loose sensor connection	Ensure sensor is securely connected
Screen not displaying	Software issue	Restart the device; if persists, reflash firmware
Calibration issues	Incorrect formula	Verify and update calibration formulas in the script

7. Build It Yourself

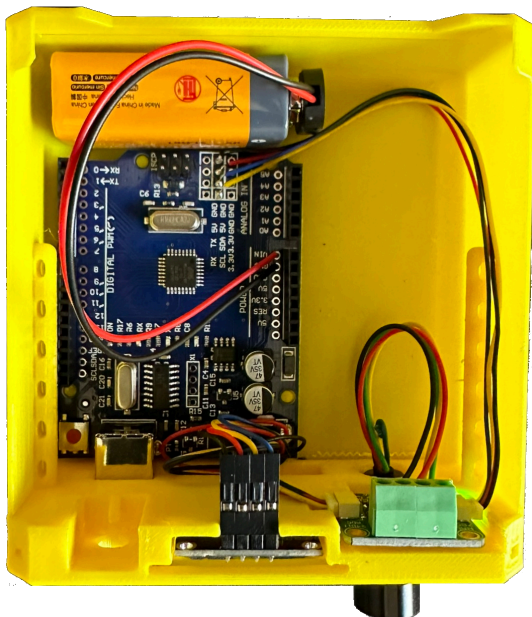As an open-source device, you can build your own version using the following components:

1. 3D Printed Enclosure

    - Download STL files: [insert link to STL files]

    - Recommended printing settings: PETG (specific print settings may vary, contact us if you need help printing)

2. Electronic Components

    - Arduino Uno: [https://a.co/d/1UN2PCq]

    - SSD1306 OLED Display: [https://a.co/d/5TuzbNX]

    - Adafruit NAU7802 24-bit ADC Module: [https://a.co/d/gCYJia9]

    - QWIIC/STEMMA Cables: [https://a.co/d/6vJCByb]

    - 9V Battery Holder: [https://a.co/d/deyltdz]

    - PG7 Liquid Tight Connector

3. Assembly Diagram

8. Technical Specifications

- Power Supply: 9V battery

- Display: SSD1306 OLED

- ADC: NAU7802 24-bit (Adafruit STEMMA interface board)

- Microcontroller: ATMEGA328P (Arduino Uno R3)

- Sensor Connection: M12 5-pin or 22ga Screw terminals

- Operating Time: 1 minute per activation

- Sensor Reference Voltage: 2.4V DC

- Power Consumption: 21mA during operation, 3mA during sleep

- Dimensions: 10 × 15 × 7 cm

- Weight: 8 oz. (225 g)

9. Safety Precautions

- Take care not to drop the device, as the OLED screen or protective lens may break.

- If the device is exposed to water, take the inner components out and dry it off as soon as possible.

- Use only the specified 9V battery type.

- Disconnect the probe when not in use to prevent damage.

- Do not attempt to open or modify the device unless following the customization instructions.

10. Warranty and Support

If you are having issues with your device, and the information in this manual has not resolved your issue, please contact us via our website at https://terrencejones.website/store or email support@terrencejones.website. The FULLBR_READER carries a 90-day warranty against defects in workmanship and materials.

For the latest updates, documentation, and community support, visit our website at https://terrencejones.website/store.